UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,717	07/26/2001	Robert C. Boman	9432-000138	6563

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EXAMINER
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ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>26 July 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

2.   **Claims 1-5** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Morin et al. (U.S. Patent No. 6,230,129), hereinafter referenced as Morin in

view of Gandhi et al. (U.S. Patent No. 5,687,287), hereinafter referenced as

Gandhi.

Regarding **claims 1 and 5**, Morin discloses a speech recognition

processor and method for processing an input speech utterance in a speech

recognition system (figure 1), comprising:

a spectral measure module (figure 5) receptive of the input speech

utterance (input speech; figure 5) for computing spectral measures of the input

speech utterance for predetermined time frames (predefined number of

segments; column 3, lines 31-34);

a time spectral pattern stage (figure 5) for concatenating (associating) a

plurality of successive spectral measures for generating a spectral pattern

vector (word model represented by vector; column 3, lines 35-40);

a normalization module (normalize phoneme similarity) which accesses

normalized values computed based upon training utterances (training

speech/utterance), said normalization module finding (data found)

corresponding normalized values for each said initial raw similarity value

(utterance of training speech) to provide a normalized similarity value (phoneme

similarity value is normalized) and concatenating normalized similarity values to

form a similarity vector (vector summation values), said initial raw similarity

value concatenating the initial raw similarity values to form a similarity vector

(column 2, lines 21-52 with column 4, lines 58-61); and

a word matcher module for comparing said similarity vector (similarity

between speech utterance) with pre-stored reference vectors (standard

phonemes; column 3, lines 16-20), but lacks a linear discriminant module.

Gandhi discloses a speech recognition processor and method comprising:

a linear discriminant module (linear discriminant function) for computing an

initial raw similarity value for each sound classification unit (speaker speaking

word which discriminate between two classes; column 5, lines 25-49) by

computing the dot product of a linear discriminant vector (dot product; column 6,

lines 38-39) with the time spectral pattern vector (time sequences; column 4,

lines 53-57 with column 8, lines 10-12), to improve speech recognition and

speaker verification.

Therefore, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to modify Morin's processor and method such

that is includes a linear discriminant module, to determine the word level

verification score, which determines the difference between the true speaker or the imposter (column 5, lines 25-46).

Regarding **claim 2**, Morin discloses the speech recognition processor and method, but lacks wherein said linear discriminant vector is computed based upon training utterances using Fisher's linear discriminant analysis.

Gandhi discloses a speech recognition processor and method wherein said linear discriminant vector is computed based upon training utterances (training utterances; column 7, lines 3-6) using Fisher's linear discriminant analysis (column 5, lines 25-49), to discriminate between two classes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Morin's processor and method such the it uses Fisher's linear discriminant analysis, to discriminate between strings spoken by the speaker and strings spoken by imposters of the speaker (column 6, line 66 – column 7, lines 2), which improves speech recognition and speaker verification (column 1, lines 6-11).

Regarding **claim 3**, Morin discloses the speech recognition processor and method, but lacks wherein said normalized values are computed by taking in-class and out-class training utterances as time spectral patterns and computing the dot product of the time spectral patterns for the training utterances with said linear discriminant vector for generating histograms of the number of occurrences of a specific score for said in-class and out-class training utterances and subtracting normalized scores for the out-class training

utterances from normalized scores for the in-class utterances to generate a normalization function.

Gandhi discloses the speech recognition processor and method wherein said normalized values (normalized; column 4, lines 53-61) are computed by taking in-class and out-class training utterances (discriminate between two classes; column 5, lines 25-49) as time spectral patterns (time sequences; column 4, lines 53-57 with column 8, lines 10-12) and computing the dot product (dot product; column 6, lines 38-39) of the time spectral patterns for the training utterances (column 7, lines 3-6) with said linear discriminant vector for generating histograms of the number of occurrences of a specific score (score information; column 4, lines 15-20 with column 2, lines 64-65) for said in-class and out-class training utterances (column 2, lines 64-65) and subtracting (difference) normalized scores for the out-class training from normalized scores for the in-class utterances (normalization likelihood score) to generate a normalization function (column 7, lines 33-56), to discriminate between classes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Morin's processor and method wherein the normalized values are computed by taking in-class and out-class training utterances, to discriminate between strings spoken by the speaker and strings spoken by imposters of the speaker (column 6, line 66 – column 7, lines 2), which improves speech recognition and speaker verification (column 1, lines 6-11).

Regarding **claim 4**, Morin discloses the speech recognition processor and

method wherein said normalization function includes normalization values

(normalization values) between +.SIGMA. and -.SIGMA (summation values;

column 3, liens 31-40).

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

- Tufts et al. (U.S. Patent No. 5,926,804) discloses discriminant neural

  networks.

- Reaves (U.S. Patent Mo. 5,826,230) discloses a speech detection device.

- Sammon et al. (U.S. Patent No. 3,755,780) discloses a method for

  recognizing characters.

4.   Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Jakieda R Jackson whose telephone number

is 703.305.5593. The examiner can normally be reached on Monday through

Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Doris To can be reached on 703. 305.4827. The fax

phone number for the organization where this application or proceeding is

assigned is 703-872-9306.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free).

JRJ
September 9, 2004

SUSAN MCFADDEN
PRIMARY EXAMINER